**Kim Schroder**

**Oil Spill Solutions**  
**Subject:** Science  
**Grade Level:** 4  
**Time Allotment:** Three45-minute class periods  
  
This lesson focuses on how engineers use various techniques to provide speedy solutions to oil spills or other threats to natural water resources. Students work in teams to analyze an “oil spill” in the classroom, then design, build, and test a system to first contain, and then remove the oil from the water. Students select from everyday items to build their oil containment and clean-up systems, evaluate the effectiveness of their solution and those of other teams, and present their findings to the class.

**[CCSS.ELA-Literacy.RI.4.3](http://www.corestandards.org/ELA-Literacy/RI/4/3/):** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

**Teacher Standards: Danielson 3C:** Engaging Students in Learning

**LEARNING OBJECTIVES**: Students will be able to:

* Hypothesize about the materials needed for their system
* Design and construct their own oil containment and removal systems
* Revise their systems as many times as needed

As a result of this activity, students should develop an understanding of environmental engineering, problem solving, and teamwork.

**Materials:**[Student Resource Oil](http://teachers.egfi-k12.org/wp-content/uploads/2010/05/Student-Resource-Oil-Spill.pdf) (pdf); [Student Worksheet](http://teachers.egfi-k12.org/wp-content/uploads/2010/05/Student-Wksht-Oil-Spill.pdf) (pdf); Water basin or sink for testing; “Oil” (use 1⁄2 cup vegetable oil mixed with cocoa powder to create the sense of crude oil); One set of materials for each group of students: Rubber bands, paper towels, string, toothpicks, cotton balls, plastic wrap, popsicle sticks, shredded wheat cereal, balloons, cooked rice, garden peat moss, grass, cork, suction tube/cooking baster, spoon, other items.  
  
**Aim:** How can we contain an oil spill?  
  
**Do Now:**  Write a hypothesis about what will happen when oil and water are mixed.  
**Mini Lesson:** Distribute to students the Student Resource sheet. These may be read in class, or provided as reading material for the prior night’s homework. Divide the class into groups of 2-3 students, providing a set of materials for each group. Explain that students must work as a team to design a system to clean up after an oil spill. The spill will be a controlled 1⁄2 cup of vegetable oil that is poured into water which is held in a container such as a water trough, large bucket, or sink.  
**Group Activity:** In their groups, students will develop a two tiered plan to first contain the oil and then to remove it. They can select from a range of everyday items provided to serve as their tools. Student teams will describe their plan in writing and with a drawing and then execute their engineered clean-up system step-by-step as described in their plan. Student clean-up systems will be scored on the following scale indicating how “clean” the water is after clean-up:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Water is completely clear of all oil | About a quarter of the oil remains | About half of the oil remains | About three quarters of the oil remains | No change, water is as oily as at the beginning of the challenge |
| 0 | 1 | 2 | 3 | 4 |

**Independent Work**: Teams complete an evaluation/reflection worksheet about the activity.  
  
**Share**: Teams present their plans and their findings to the class.

**Assessment:** Students will be assessed on their science notebook with experimental data. Students will complete worksheet reflection questions.